



IMPLICATIONS OF CONSTRUCTIVISM LEARNING THEORY ON STUDENTS' CRITICAL THINKING SKILLS: A THEORETICAL STUDY

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Abstract

Education is an important foundation in the development of individuals and society. In the challenging modern era, the education system must be able to develop critical thinking skills in students. Constructivism learning theory, which emphasizes students' active role in constructing knowledge, offers a relevant approach for this purpose. This study explores the implications of applying constructivism theory to the development of student's critical thinking skills through a qualitative method with theoretical review and literature study. The findings show that problem-based learning strategies, group discussions, and collaborative projects are effective in improving critical thinking skills. However, the implementation of this theory varies depending on the educational context and teacher readiness. In developed countries, the implementation of constructivism is more successful than in developing countries, which face challenges such as lack of resources and teacher training. The results of this study offer practical guidance for educators and policymakers in designing curricula that are responsive to student's needs, as well as making a significant contribution to the education literature.

Keywords: Constructivism, education, critical thinking, learning strategies, theory implementation

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INTRODUCTION

مقدمة

Education has always been an important foundation in the development of individuals and society. Amidst rapid changes in the modern world, the education system is required to not only convey knowledge but also develop critical thinking skills in students. Constructivism learning theory, which emphasizes the active role of students in constructing their own knowledge, has gained significant attention in this context (Nurhidayati, 2017). On the basis of this theory, students are encouraged to relate new information to existing knowledge, creating deep and relevant meaning. This, in turn, can strengthen critical thinking skills that are indispensable in facing today's challenges.

Since the emergence of constructivism theory pioneered by Jean Piaget and Lev Vygotsky, this approach has overhauled the perspective in education. Constructivism focuses on how students construct knowledge through active interaction with their environment (Tohari & Rahman, 2024). In the context of learning, this means that students are no longer seen as passive recipients of information, but rather as active agents who play an important role in their own learning process. This transformation is particularly relevant given the challenges facing today's education system, where critical thinking skills are one of the key competencies that every individual must possess in order to adapt and succeed.

Constructivism learning theory offers a valuable perspective in developing students' critical thinking skills. In contrast to traditional approaches that emphasize memorization of facts, constructivism encourages students to construct their own understanding through a process of exploration and reflection (Sugrah, 2019). Through discussions, problem-solving, and collaborative projects, students are encouraged to think critically and creatively. This approach puts students at the center of the learning process, giving them the opportunity to become independent and innovative thinkers (Firdaus et al., 2023). Thus, constructivism theory not only improves students' academic knowledge but also strengthens essential critical thinking skills.

Critical thinking skills are considered one of the most significant outcomes of applying constructivism learning theory in education. Research shows that when students are given the opportunity to be actively involved in the learning process, they tend to develop better analytical and evaluative skills (Tohari & Rahman, 2024). This argumentation is supported by various studies that indicate that students who learn through constructivist methods show improvement in critical thinking skills compared to those who learn through traditional methods (Firdaus et al., 2023). Therefore, the integration of constructivism theory in the educational curriculum is not only a pedagogical innovation but also an urgent need to prepare students for the dynamics and complexity of the future world.

In today's world of education, there is a growing concern about the lack of critical thinking skills among students. Despite various educational reform efforts, many students still have difficulties in analyzing information, evaluating arguments, and making informed decisions. Constructivism learning theory has been proposed as a potential solution to this problem, by emphasizing the active role of students in constructing their own knowledge through interaction with the environment and hands-on experience (Vijaya Kumari, 2014). However, in practice, the implementation of constructivism in the classroom often encounters various barriers, such as time constraints, lack of teacher training, and unfamiliarity with how to integrate this approach into the curriculum effectively. This raises questions about the extent to which this theory can actually improve students' critical thinking skills in the field.

A key problem in our education system is the inability of many students to think critically, a skill that is crucial in the 21st century. Although constructivism theory has been widely recognized as an effective approach to developing this skill, its implementation is often not in line with the theory. Many teachers are still stuck in traditional teaching methods that do not provide space for students to actively engage and think critically. On the other hand, the lack of strong empirical evidence on the effectiveness of constructivism in various educational contexts adds to the complexity of this issue. Therefore, this study aims to explore the real implications of constructivism learning theory on students' critical thinking skills, as well as identify challenges and opportunities in its application in the classroom.

Although the theory of constructivism has been widely accepted in education and many studies have been conducted to explore its application, there is still a significant gap in the literature that addresses how this theory can be specifically linked to the development of student's critical thinking skills. Most existing studies focus more on the application of the general principles of constructivism in a learning context, without conducting an in-depth analysis of its direct impact on students' critical thinking skills. For example, many studies only discuss theoretical aspects of constructivism or explore teaching practices without explicitly linking them to cognitive outcomes such as critical thinking (Mukhlis & Yus, 2023). This research aims to fill this gap by providing a more detailed theoretical review of how elements of constructivism theory can be adapted to enhance students' critical thinking skills in a concrete and applicable

learning context.

The gaps in the existing literature point to the need for a more in-depth study of the practical effects of applying constructivism theory on the development of student's critical thinking skills. Most previous studies tend to be limited to descriptive case studies or provide general guidance on the principles of constructivism without systematically investigating the specific mechanisms that can stimulate students' critical thinking skills. This research is designed to address these shortcomings by developing a theoretical framework that links constructivism principles with practical strategies to enhance critical thinking, as well as providing new insights that can enrich academic discourse and offer practical applications in educational settings.

This study aims to explore in depth the implications of applying constructivism learning theory to developing students' critical thinking skills. In the context of modern education, the ability to think critically is one of the main competencies that students must have to be able to adapt to the rapid changes and complexity of information. Therefore, this research focuses on how constructivist approaches can be effectively applied in the classroom to encourage students to become independent and analytical thinkers. Specifically, this study aims to identify the most effective learning strategies in integrating the principles of constructivism and measure the real impact of the implementation of these strategies on improving students' critical thinking skills. It is hoped that the results of this research can provide practical guidance for educators and policymakers in designing curricula and teaching methods that are more effective and responsive to the needs of students in this digital era.

Although constructivism theory has been widely accepted as an effective framework in education, most existing studies have focused on the general application of its principles without investigating in depth how this theory can specifically improve students' critical thinking skills. This research offers a novel contribution by proposing a detailed theoretical study of how core elements of constructivism - such as problem-based learning and collaboration - can be integrated into teaching strategies designed to strengthen students' critical thinking skills. By providing a theoretical model that addresses the practical application of constructivism in the context of critical thinking development, this research not only expands academic understanding of the application of the theory but also offers innovative solutions that educators can adapt to more effectively improve student learning outcomes.

This research provides an important justification for exploring the application of constructivism theory in the context of improving students' critical thinking skills by identifying a gap in the existing literature. While many studies have addressed the theoretical and practical aspects of constructivism in general, this study fills a significant gap by focusing on how the principles of constructivism can be applied specifically to develop students' critical thinking skills. By designing a theoretical framework that combines the principles of constructivism with practical strategies, this study aims to offer new guidelines that not only enrich academic discourse but also make practical contributions to curriculum development and teaching methodologies in various educational settings.

METHOD

منهج

This research adopts a qualitative design with a theoretical review approach that focuses on a literature study to investigate the implications of constructivism learning theory for the development of student's critical thinking skills. The methodology was designed to explore and analyze relevant literature in the field of constructivism and critical thinking skills through a

systematic evaluation of academic articles, books, and research reports published within the last five years. The data for this study was collected by applying a structured literature search technique, using reliable sources from academic databases such as JSTOR, Google Scholar, and ProQuest. The data collection process was conducted by screening the literature based on its relevance to the research topic, the credibility of the sources, and its contribution to the understanding of constructivism in educational practice. Data analysis was conducted through a thematic analysis approach, which involved organizing data, categorizing information, and assessing key themes and patterns that emerged from the literature review. The purpose of this analysis was to relate the theoretical findings to real-world applications and explore the effectiveness of constructivist approaches in varied educational contexts. With this methodology, this research aims to make a significant contribution to the development of constructivism-based educational theory and practice.

RESULT | نتائج

Based on the literature analysis conducted through the qualitative approach of theoretical review and literature study, some of the main findings regarding the implications of constructivism learning theory on students' critical thinking skills can be identified as follows:

1. Effectiveness of Constructivism Strategy in Critical Thinking Development

The implementation of constructivism-based learning strategies, such as problem-based learning (PBL), group discussions, and collaborative projects, has proven effective in improving students' critical thinking skills. Various studies show that these methods encourage students to be actively involved in the learning process, facilitating deep understanding and the development of analytical and evaluative skills (Chasbullah, n.d.).

2. Different Applications of Constructivism in Different Educational Contexts

The implementation of constructivism theory shows variations in effectiveness depending on the educational context and students' backgrounds. In developed countries, the application of constructivism is more often successful compared to developing countries, where factors such as lack of resources, inadequate teacher training, and resistance to changes in teaching methods are major challenges (Rahmani et al., 2023).

3. Teacher's Role in the Implementation of Constructivism

Teachers have a key role in implementing constructivism theory in the classroom. The quality of the implementation of constructivist methods is highly dependent on teachers' readiness to design and manage learning environments that support active exploration and critical reflection. Ongoing professional training and support from educational institutions have been shown to increase the effectiveness of constructivist methods (Made et al., 2024).

4. The Effect of Constructivism on Critical Thinking Skills at Various Educational Levels

The application of constructivism principles has a positive impact on critical thinking skills at various levels of education, from basic education to higher education. The results of the analysis show that the application of constructivism can help students develop critical thinking skills gradually, with an approach that is tailored to their level of cognitive development (Mukhlis & Yus, 2023).

5. Long-term Benefits of a Constructivist Approach

The long-term benefits of constructivist approaches include lasting improvements in critical thinking skills and students' readiness to face complex challenges outside the formal education environment. Findings show that students who engage in constructivist learning experiences tend to be better prepared to think critically and creatively in real-life situations (Meutiawati et al., 2023).

DISCUSSION

مناقشة

Interpretation of the Concept of Constructivism in a Learning Context

Constructivism theory, developed by Jean Piaget and Lev Vygotsky, provides a comprehensive theoretical foundation for understanding the way students construct their knowledge and skills through experience and social interaction (Liu & Matthews, 2005). Piaget views learning as an active process in which students do not just receive information, but also actively shape their understanding through interaction with their world. According to Piaget, knowledge is not an entity that is passively imparted by the teacher, but rather the result of a dynamic process in which individuals actively construct and adjust their mental schema (Chand, 1995). This process involves *assimilation*, in which students integrate new information into existing cognitive structures, and *accommodation*, in which students change their schemas to adapt to new information that does not fit into previous schemas. Piaget believed that direct experience and exploration are key to learning, as students construct their knowledge through their own actions and reflections. This principle underlies the constructivist approach which encourages students to be actively involved in their learning process, rather than just receiving knowledge delivered by the teacher (Chand, 1995).

In the development of constructivism theory, Vygotsky introduced the concept of the Zone of Proximal Development (ZPD), which emphasizes the importance of social interaction in the learning process (Liu & Matthews, 2005). According to Vygotsky, the ZPD is the distance between what students can do independently and what they can achieve with help from more experienced people, such as teachers or classmates (Liu & Matthews, 2005). In this context, learning is considered a social process where students construct knowledge through dialog and collaboration with others. Vygotsky suggested that this social interaction, which involves guidance and support from the teacher, is a crucial component in students' cognitive development (Tohari & Rahman, 2024). This concept suggests that learning is not just about coping with tasks or solving problems, but also about constructing new knowledge through interactions that support and guide students from current to higher levels of understanding (Chand, 1995). Therefore, constructivism theory directs us to design learning environments that provide opportunities for students to collaborate, discuss, and receive constructive feedback in their learning process.

This concept of constructivism has important implications in the context of developing students' critical thinking skills, where constructivist learning focuses on creating learning experiences that stimulate reflective and critical thinking (Winarti et al., 2018). Duffy and Jonassen argue that constructivist learning encourages students to take an active role in their learning process, which involves analyzing problems, assessing arguments, and forming evidence-based conclusions (Winarti et al., 2018). In the Problem-Based Learning model, students are exposed to situations that require creative and critical problem-solving. This activity encourages students to formulate questions, seek information, and evaluate various solutions to

complex problems (Herlita et al., 2023). This model is not just about finding the right answer, but also about developing the ability to think critically about possible solutions and deep reflection on learning outcomes (Setyabrata et al., 2023). Thus, the constructivist approach provides a structure for students to engage in activities that stimulate critical thinking and the development of analytical skills essential for their academic and professional success.

In constructivist learning practices, the role of the teacher is as a facilitator who supports students' learning process by designing challenging activities and providing constructive feedback (Tohari & Rahman, 2024). Wood explained that teachers in the constructivist approach do not only function as a source of knowledge but as a guide who helps students in the process of exploration and discovery of knowledge. Teachers should create a learning environment that encourages students to ask questions, discuss, and explore concepts in depth. This strategy involves using techniques such as open-ended questions that stimulate critical thinking, group activities that encourage collaboration, and formative assessments that provide constructive feedback (Suoth et al., 2022). Through this role, educators not only support student learning but also shape the context in which students can develop the critical thinking skills needed to understand and apply knowledge in a variety of situations (Sugrah, 2019).

In conclusion, the application of constructivism theory in education not only provides a theoretical basis for understanding how students construct their knowledge but also offers a practical approach to improving critical thinking skills through effective curriculum design and teaching strategies (Tohari & Rahman, 2024). According to Hmelo-Silver, the constructivist approach to learning provides a framework that allows students to engage in activities that stimulate critical and reflective thinking. In this model, students are allowed to actively identify problems, seek solutions, and reflect on their learning outcomes. This shows that constructivism theory is not only useful as an academic concept but also as a practical tool for designing learning experiences that support the development of student's critical thinking skills (Suparlan, 2019). By integrating the principles of constructivism in curricula and teaching strategies, educators can create a learning environment that encourages students to think critically and construct their knowledge more effectively and sustainably (Rahmani et al., 2023).

Overall, constructivism theory offers a holistic approach to improving students' critical thinking skills by emphasizing students' active role in the learning process, the importance of social interaction, and teaching strategies that support exploration and reflection. This approach guides educators to design learning experiences that not only increase knowledge but also strengthen students' critical thinking skills through methods based on experience, collaboration, and constructive feedback (Tohari & Rahman, 2024). By understanding and applying the principles of constructivism in a learning context, educators can create an environment that supports the development of complex and deep cognitive skills, which are essential for students' success in education and their future lives.

Analysis of Constructivist Learning Models that Enhance Critical Thinking

Constructivist learning models offer a diverse approach to improving students' critical thinking skills, with strategies and techniques that focus on active engagement and deep reflection. These models are *Problem-Based Learning* (PBL), *Project-Based Learning* (PBL), *Inquiry-Based Learning* (IBL), and *Collaborative Learning* (CL).

1. Problem-Based Learning

One model often discussed in the literature is *Problem-Based Learning* (PBL), which is

designed to develop critical thinking skills through complex and authentic problems. In PBL, students are exposed to real situations that require analysis, investigation, and decision-making based on available information (Masrinah et al., 2019). This model not only provides intellectual challenges to students but also encourages them to work collaboratively in groups, building new knowledge through interaction and discussion. Research shows that PBL can improve students' critical thinking skills in a more structured and systematic way compared to traditional learning methods that often focus on one-way knowledge transfer. PBL allows students to explore information in depth, formulate hypotheses, and develop arguments based on evidence, thus training them in analytical and reflective thinking (Ulhaq et al., 2020).

2. Project-Based Learning

Project-Based Learning (PjBL) is also a significant constructivist approach in the context of improving critical thinking. Project-based learning offers students the opportunity to apply their knowledge in a broader and more realistic context. In this model, students engage in long-term projects that require them to plan, collect data, and evaluate the outcomes of their projects (Rineksiane, 2022). Through this process, students not only learn the subject matter but also develop the critical thinking skills needed to design, execute, and assess their projects. These activities promote skills such as problem-solving, research, and critical reflection, all of which are key aspects of critical thinking. Project-based learning can improve students' critical thinking skills by providing opportunities for them to apply knowledge in complex and integrated contexts (Prajoko et al., 2023).

3. Inquiry-Based Learning

The Inquiry-Based Learning (IBL) model also offers an effective constructivist approach to improving students' critical thinking skills. IBL focuses on engaging students in a process of deep inquiry, where students ask questions, conduct experiments, and analyze data to construct their knowledge (Lederman, 1992). In this model, students are allowed to formulate research questions, design experiments, and evaluate their experimental results. This approach not only helps students understand scientific concepts but also develops critical thinking skills such as hypothesis formulation, data collection and analysis, and evidence-based inference (Lederman, 1992). IBL provides a context where students can experience the scientific process themselves, which facilitates a deeper understanding of the way knowledge is constructed and tested.

4. Collaborative Learning

In the context of the Collaborative Learning (CL) model, this approach emphasizes the importance of social interaction in learning as a way to improve students' critical thinking skills. Collaborative learning involves students working together in groups to achieve a common goal, where they share knowledge, and discuss and solve complex tasks (Rahman et al., 2022). This model supports the development of critical thinking skills through structured discussions, where students are expected to evaluate arguments, question assumptions, and build consensus among group members (Mahsus & Latipah, 2021). Research shows that collaboration in groups can broaden students' perspectives, improve their ability to think critically, and strengthen their understanding of the subject matter (Apriono, 2013). By facilitating productive social interactions, collaborative learning offers an environment that supports the development of deeper and more purposeful critical thinking skills.

These constructivist learning models, although different in their approaches and techniques, have in common their goal of improving students' critical thinking skills through active and reflective learning designs. Each model offers a unique way to engage students in a deeper learning process and focuses on complex cognitive skills (Tohari & Rahman, 2024). PBL and PjBL allow students to apply knowledge in situations that demand problem-solving and critical judgment, while IBL provides opportunities for students to engage in scientific processes that demand exploration and analysis. On the other hand, CL provides a platform for students to collaborate and explore ideas collectively, which also supports the development of critical thinking skills (Nugrahanti et al., 2022). Thus, the application of these different models in educational practice provides a variety of strategies to support the development of student's critical thinking skills, offering a flexible and adaptive approach to different learning needs.

Analysis of constructivist learning models shows that these approaches not only contribute to concept learning but also play an important role in the development of student's critical thinking skills. Each model offers different methods to activate student engagement in the learning process, whether through problem-solving, practical projects, scientific inquiry, or social collaboration. Research and practice show that the application of these models in an educational context can significantly improve students' critical thinking skills, making them valuable tools in the design of curricula and teaching strategies that aim to develop more complex and deep cognitive skills (Tohari & Rahman, 2024). By understanding and applying these models, educators can create a learning environment that not only facilitates knowledge learning but also strengthens students' critical thinking skills essential for their future academic and professional success.

Critiques and Weaknesses in the Application of Constructivism for Critical Thinking

Although constructivist theory offers an innovative approach to improving students' critical thinking skills, its application in educational practice faces a range of significant criticisms and weaknesses. One of the main criticisms of constructivist approaches is the difficulty in balancing between independent exploration and support from educators. In the context of constructivism, students are expected to actively construct their own knowledge through direct experience and reflection (Winarti et al., 2018). However, the implementation of this principle often poses challenges in terms of how much guidance educators should provide. Some researchers consider that without adequate guidance, students may struggle to achieve deep and effective understanding (Kusumawati et al., 2022). Learning strategies that rely entirely on independent exploration often ignore students' need for structure and direction in the learning process. In practice, students may not have the necessary skills or prior knowledge to construct and evaluate arguments independently, which can hinder the development of the desired critical thinking skills (Basri et al., 2021).

Another drawback of implementing constructivism is the challenge of assessing the effectiveness of learning based on this approach. Constructivist learning often involves activities that are subjective and qualitative, such as group discussions, projects, and personal reflections (Wahyuningsih, 2021). This makes it difficult to develop objective and measurable assessment methods to evaluate the achievement of students' critical thinking skills. Assessment in the context of constructivism tends to rely on descriptive, observation-based rubrics, which are often not specific enough to accurately measure learning outcomes (Haryanto, 2013). This reliance on qualitative assessment can lead to variability in assessment caused by teachers' subjective perceptions and individual interpretations of student performance. Consequently, inconsistent assessments can make it difficult for educators to assess the effectiveness of constructivist

learning strategies and determine whether learning objectives, such as the development of critical thinking skills, have been achieved (Anggraini et al., 2024).

In addition, the application of constructivism in education often faces problems in terms of acceptance by educators and students, which can hinder its effectiveness in improving critical thinking skills (Tohari & Rahman, 2024). Many educators are accustomed to traditional learning models that are more structured and didactic, and they may find it difficult to switch to more flexible and less structured methods such as constructivism (Herlita et al., 2023). Some educators feel that constructivist approaches are too demanding and require significant changes in the way they design and manage the classroom. In addition, students may also have difficulty in adapting to a more open and independent learning approach, especially if they are more accustomed to learning based on direct instruction and fact testing (Setyabrata et al., 2023). Skepticism from both sides - educators and students - towards constructivist methods may limit their successful implementation and, ultimately, reduce their effectiveness in developing critical thinking skills.

Another frequent criticism of constructivist approaches is the challenge of providing adequate resources to support this learning model. Constructivist approaches often require more resources than traditional learning methods, both in terms of materials and time (Tohari & Rahman, 2024). Models such as PBL or IBL require access to a variety of information sources, learning tools, and sufficient time for exploration and reflection, which is often an obstacle for many educational institutions that have limited budgets (Nerita et al., 2023). In this context, limited resources can affect educators' ability to design and implement learning activities that are in line with the principles of constructivism and, ultimately, affect student learning outcomes in terms of critical thinking skills development (Rahmani et al., 2023).

In addition, there are also criticisms of the effectiveness of constructivism in achieving educational equity in various contexts. Constructivist approaches often require certain readiness and background knowledge from students to function well, which may not always be available in heterogeneous educational contexts (Tohari & Rahman, 2024). Students with more homogeneous backgrounds tend to be more successful in constructivist settings compared to students who come from highly varied backgrounds. In diverse classroom contexts, differences in learning readiness and access to resources can result in inequalities in the application of constructivism principles, which in turn can affect the effectiveness of this strategy in developing critical thinking skills equally among all students (Nerita et al., 2023).

The implementation of constructivism often faces challenges in terms of adapting the curriculum to the specific needs of students and the demands of prevailing academic standards. Constructivist approaches, with their focus on independent exploration and experiential learning, may not always align with curricula designed to meet specific academic standards or standardized tests (Julina, 2023). Curricula designed to meet strict academic standards may not provide enough space for flexible constructivist approaches, leading to tension between the demands of the curriculum and the learning methods proposed by constructivist theory. The mismatch between standards-based curricula and constructivist approaches may limit the implementation of constructivist principles and, as a result, reduce success in achieving learning objectives related to critical thinking (Hakiky et al., 2023).

Overall, constructivism theory offers various benefits in the development of students' critical thinking skills, but its application in educational practice is not free from criticism and weaknesses. These weaknesses include challenges in balancing guidance and independent exploration, assessment of learning effectiveness, acceptance by educators and students,

provision of resources, educational equity, and curriculum alignment with academic standards. Each of these issues provides an important perspective in understanding how constructivism theory can be adapted and applied more effectively in educational contexts to improve students' critical thinking skills. Recognizing and addressing these criticisms is an important step in developing learning approaches that are not only theoretically grounded but also practical and effective in real educational settings.

CONCLUSION

خاتمة

An analysis of the literature on the impact of constructivist learning theories on students' critical thinking skills shows that strategies such as problem-based learning, group discussions, and collaborative projects are effective in improving critical thinking skills. The application of these theories varies by educational context and student background, with better results in developed than developing countries. Teachers play an important role in this application, where ongoing professional training increases its effectiveness. Constructivism has a positive impact at different levels of education, helping students develop critical thinking skills gradually. Long-term benefits include students' readiness to face complex challenges beyond formal education. However, implementing constructivism faces challenges such as the balance between independent exploration and teacher guidance, difficulties in assessment, acceptance by educators and students, resource limitations, educational equity, and alignment with curriculum standards. These challenges need to be addressed to optimize the development of student's critical thinking skills through a constructivist approach.

BIBLIOGRAPHY

مراجع

- Anggraini, N., Pioma Gabe Pardede, O., & Studi Pendidikan Guru Sekolah Dasar Fakultas Ilmu Pendidikan, P. (2024). Evaluasi Efektivitas Teknik Penilaian Formatif dalam Meningkatkan Hasil Pembelajaran Siswa Sekolah Dasar. *Jurnal Pendidikan Tambusai*, 8(1), 15159–15162. <https://doi.org/10.31004/JPTAM.V8I1.14533>
- Apriono, D. (2013). PEMBELAJARAN KOLABORATIF: Suatu Landasan untuk Membangun Kebersamaan dan Keterampilan. *DIKLUS*, 17(1). <http://journal.uny.ac.id/diklus/article/view/2897>
- Basri, H., Jannah, U. R., Nuritasari, F., & Yahya, A. (2021). Identifikasi kemampuan berpikir kritis siswa pada masalah dengan informasi yang kontradiksi. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, 10(1), 63–78.
- Chand, S. P. (1995). Constructivism in education: Exploring the contributions of Piaget, Vygotsky, and Bruner. *Children*, 10.
- Chasbullah, W. (n.d.). *Implementasi Pembelajaran Berbasis Konstruktivisme*.
- Firdaus, A., Sugilar, H., & Aditya, A. H. Z. (2023). Teori Konstruktivisme dalam Membangun Kemampuan Berpikir Kritis. *Gunung Djati Conference Series*, 28, 30–38. <https://conferences.uinsgd.ac.id/index.php/gdcs/article/view/1776>
- Hakiky, N., Nurjanah, S., & Fauziati, E. (2023). Kurikulum merdeka dalam perspektif filsafat konstruktivisme. *Tsaqofah*, 3(2), 194–202.

- Haryanto, Z. (2013). Efektivitas Model Lesson Study dalam Penerapan Pembelajaran Konstruktivisme pada SMA/MA di Kabupaten Kutai Barat Provinsi Kalimantan Timur Tahun 2012. *Media Komunikasi FPIPS*, 12(1).
- Herlita, F., Yamtinah, S., & Wati, I. K. (2023). The Effect of the PjBL-STEM Model on Students' Critical Thinking Ability in Science Learning. *Jurnal Inovasi Pendidikan IPA*, 9(2), 192–202. <https://doi.org/10.21831/JIPI.V9I2.57963>
- Julina, S. (2023). Peran Indonesia dalam Keketuaan ASEAN 2023: Perspektif Konstruktivisme. *Jurnal Alternatif*, 14(2). <https://jurnal.fisipjayabaya.com/index.php/alternatif/article/view/5>
- Kusumawati, I. T., Soebagyo, J., & Nuriadin, I. (2022). Studi Kepustakaan Kemampuan Berpikir Kritis Dengan Penerapan Model PBL Pada Pendekatan Teori Konstruktivisme. *JURNAL MathEdu*, 5(1), 13–18.
- Lederman, N. G. (1992). Students' and teachers' conceptions of the nature of science: A review of the research. *Journal of Research in Science Teaching*, 29(4), 331–359.
- Liu, C. H., & Matthews, R. (2005). Vygotsky's philosophy: Constructivism and its criticisms examined. *International Education Journal*, 6(3), 386–399. <http://iej.cjb.net>
- Made, P., Pramana, A., Ketut Suarni, N., & Gede Margunayasa, I. (2024). Relevansi Teori Belajar Konstruktivisme dengan Model Inkuiri Terbimbing terhadap Hasil Belajar Siswa. *Ideguru: Jurnal Karya Ilmiah Guru*, 9(2), 487–493. <https://doi.org/10.51169/IDEGURU.V9I2.875>
- Mahsus, M., & Latipah, E. (2021). Metodologi Eduinnova: Pembelajaran kolaboratif yang diintegrasikan dengan teknologi untuk meningkatkan keaktifan dan interaksi siswa dalam pembelajaran daring. *Jurnal Inovasi Teknologi Pendidikan*, 8(1), 1–8. <https://doi.org/10.21831/JITP.V8I2.38706>
- Masrinah, E. N., Aripin, I., & Gaffar, A. A. (2019). PROBLEM BASED LEARNING (PBL) UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR KRITIS. *Prosiding Seminar Nasional Pendidikan*, 1, 924–932. <https://prosiding.unma.ac.id/index.php/semnasfkip/article/view/129>
- Meutiawati, I., Uin, A.-R., & Banda, A. (2023). KONSEP DAN IMPLEMENTASI PENDEKATAN KONTEKSTUAL DALAM PROSES PEMBELAJARAN. *Jurnal Mudarrisuna: Media Kajian Pendidikan Agama Islam*, 13(1), 80–90. <https://doi.org/10.22373/JM.V13I1.18099>
- Mukhlis, A., & Yus, A. (2023). BERPIKIR KRITIS DAN KREATIF DITINJAU DARI FILSAFAT KONSTRUKTIVISME PADA PENDIDIKAN DASAR. *Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, 1(2), 56–62. <https://ejournal.unida-aceh.ac.id/index.php/guree/article/view/660>
- Nerita, S., Ananda, A., & Mukhaiyar, M. (2023). PEMIKIRAN KONSTRUKTIVISME DAN IMPLEMENTASINYA DALAM PEMBELAJARAN. *JURNAL EDUCATION AND DEVELOPMENT*, 11(2), 292–297. <https://doi.org/10.37081/ED.V11I2.4634>
- Nugrahanti, R., Nugrahanti, R., Suryadi, A., & Dewi, H. I. (2022). STUDI MODEL PEMBELAJARAN KONSTRUKTIVISME BERBASIS MIND MAPPING UNTUK PEMBELAJARAN BAHASA INDONESIA DI SEKOLAH DASAR. *Instruksional*, 4(1). <https://doi.org/10.24853/instruksional.4.1.%p>
- Nurhidayati, E. (2017). Pedagogi Konstruktivisme dalam Praksis Pendidikan Indonesia. *Indonesian Journal of Educational Counseling*, 1(1), 1–14. <https://doi.org/10.30653/001.201711.2>

- Prajoko, S., Sukmawati, I., Maris, A. F., & Wulanjani, A. N. (2023). Project Based Learning (PjBL) Model with STEM Approach on Students' Conceptual Understanding and Creativity. *Jurnal Pendidikan IPA Indonesia*, 12(3), 401–409. <https://doi.org/10.15294/JPII.V12I3.42973>
- Rahman, A., Masitoh, S., & Mariono, A. (2022). Collaborative Learning to Improve Creative and Critical Thinking Skills: From Research Design to Data Analysis. *International Journal of Educational Review*, 4(1), 79–96. <https://doi.org/10.33369/IJER.V4I1.22016>
- Rahmani, N. A., Yusuf, A., Izzati, N. W., & Aqilla, N. A. (2023). RELEVANSI FILSAFAT KONSTRUKTIVISME DALAM MENINGKATKAN PENDIDIKAN SISWA DI ERA DIGITAL. *Journal Genta Mulia*, 15(1), 36–47.
- Rineksiane, N. P. (2022). Penerapan metode pembelajaran project based learning untuk membantu siswa dalam berpikir kritis. *Jurnal Pendidikan Manajemen Perkantoran*, 7(1), 82–91.
- Setyabrata, I. B., Sholikhah, O. H., & Satdewo, S. (2023). Meningkatkan Keterampilan Berpikir Kritis Siswa Kelas 4 IPAS melalui Pendekatan Problem Based Learning dalam KUMER. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, 8(1), 7159–7168. <https://doi.org/10.23969/JP.V8I1.8299>
- Sugrah, N. (2019). Implementasi teori belajar konstruktivisme dalam pembelajaran sains. *Humanika, Kajian Ilmiah Mata Kuliah Umum*, 19(2), 121–138.
- Suoth, L., Mutji, E. J., & Balamu, R. (2022). Penerapan Pendekatan Konstruktivisme Vygotsky Terhadap Pembelajaran Bahasa Indonesia. *Journal for Lesson and Learning Studies*, 5(1), 48–53. <https://doi.org/10.23887/JLLS.V5I1.40510>
- Suparlan. (2019). *Teori Konstruktivisme dalam Pembelajaran*. ISLAMIKA: JURNAL KEISLAMAMAN DAN ILMU PENDIDIKAN. <https://ejournal.stitpn.ac.id/index.php/islamika/article/view/208/170>
- Tohari, B., & Rahman, A. (2024). Konstruktivisme Lev Semonovich Vygotsky dan Jerome Bruner: Model Pembelajaran Aktif dalam Pengembangan Kemampuan Kognitif Anak. *Nusantara: Jurnal Pendidikan Indonesia*, 4(1), 209–228. <https://doi.org/10.14421/NJPI.2024.V4I1-13>
- Ulhaq, R., Huda, I., & Rahmatan, H. (2020). Pengaruh Model Pembelajaran Problem Based Learning Dengan Modul Kontruktivisme Radikal Terhadap Hasil Belajar Peserta Didik. *Jurnal IPA & Pembelajaran IPA*, 4(2), 244–252. <https://doi.org/10.24815/JIPI.V4I2.17874>
- Vijaya Kumari, S. N. (2014). Constructivist Approach to Teacher Education: An Integrative Model for Reflective Teaching. *Journal on Educational Psychology*, 7(4), 31–40.
- Wahyuningsih, S. (2021). Pembelajaran Berbasis Konstruktivisme untuk Meningkatkan Aktivitas dan Prestasi Belajar Siswa pada Materi Pokok Himpunan. *Jurnal Pendidikan Dan Pembelajaran Indonesia (JPPI)*, 1(1), 10–21. <https://doi.org/10.53299/JPPI.V1I1.19>
- Winarti, E. R., Waluya, B., & Rochmad, R. (2018). MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS MELALUI PROBLEM BASED LEARNING DENGAN PEER FEEDBACK ACTIVITY. *Jurnal Pembelajaran Matematika*, 5(2). <https://jurnal.uns.ac.id/jpm/article/view/26056>

